

REMARKS

Claims 1-12 remain in this application. Claims 1, 5, 8 and 12 have been amended to better define Applicants inventions. It is not believed that this amendment materially changes the scope of the claims and thus, entry is proper.

Figure 1 has been amended per the suggestion of the Examiner.

The Examiner has rejected the claims relying on patents to Kakibayashi and Kokubo both of which relate to transmission electron microscopes. Applicants respectfully traverse these rejections.

The characteristic feature of the present invention is in a scanning type charged-particle microscope having an annular aperture positioned between the charged-particle source and the scanning deflector in order to improve a resolving power and simultaneously in making a depth of focus large.

The above amended claims 1, 5 and 12 clearly define this feature, and the above amended claim 8 clearly also has the above feature by defining "aperture for limiting the passage of said charged-particle optical beam" as the annular aperture in the same way.

As the Examiner has noted, Transmission Electron Microscopes having such an annular aperture are known. However in the present invention, the annular aperture is used in a Scanning Electron Microscope and such a Scanning Electron Microscope having an annular aperture as claimed is not shown in any of the cited references.

The Examiner asserts that it is very easy for the person skilled in the art to use the annular aperture used in the Transmission Electron Microscope in Scanning Electron microscope as in the present invention. Applicants submit that the Examiner is not correct, because the annular aperture used in the Scanning electron Microscope is new and produces a particularly advantageous effect that is not found in the Transmission Electron Microscope, for the following reasons.

In a Scanning Electron Microscope in which the image of the sample is obtained by scanning the electron beam on the sample, the resolving power is determined by the diameter of the electron beam as usually known. That is, in the Scanning Electron microscope, in order to obtain a high resolving power, the diameter of the electron beam should be very small and a very thin electron beam should be scanned on the surface of the sample. However, when obtaining the high resolution by making the electron beam thin, the focal point distance becomes small, and a problem with this is that the depth of the focus becomes small.

In such a situation, in order to obtain the high resolving power and simultaneously a large depth of focus, the annular aperture is positioned between the charged-particle source and the scanning deflector in the Scanning Electron Microscope. In this way, in accordance with the present invention, the annular aperture is used in order to solve the above problem which is characteristic in the Scanning Electron Microscope.

In Kakibayashi and Kokubo, the annular aperture which is used in a Transmission Electron Microscope, is shown. However, they do not show using an annular aperture as is used in a Scanning Electron Microscope and teach nothing about the problem of obtaining the high resolving power and simultaneously the large depth of the focus that occurs in a Scanning Electron Microscope and the effect of the annular aperture in solving this problem. Therefore, although the annular aperture is used in a Transmission Electron Microscope, this does not in any way suggest the use of the annular aperture of the Transmission Electron Microscope for a different and unobvious use in a Scanning Electron Microscope. Nothing in the references suggests the problem or its solution.

Applicants note that, in claim 8 of the present application, there is no direct recitation of the words "annular aperture." However, essentially the same function as the "annular aperture" is defined by the language "charged-particle beam focused on said sample is radiated so that the half-opening angle of said aperture for the charged-particle beam will have a band with respect to specific values of α_a and α_b , said band having narrower said half-opening angle is cut off".

With entry of this amendment it is believed that all claims remaining in this application will be in condition for allowance. Thus, entry of this amendment and prompt notice thereof is respectfully solicited.

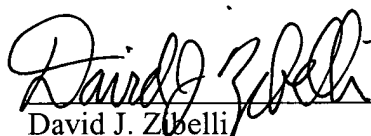
The Examiner is invited to contact the undersigned to discuss any matter concerning this application.

The Examiner is requested, after reviewing this response to contact the undersigned to discuss any remaining issues in this application.

The Office is authorized to charge any additional fees or credit any overpayment under 37 C.F.R. § 1.16 or 1.17 to Deposit Account No. 11-0600.

Respectfully submitted,

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FIG. 1

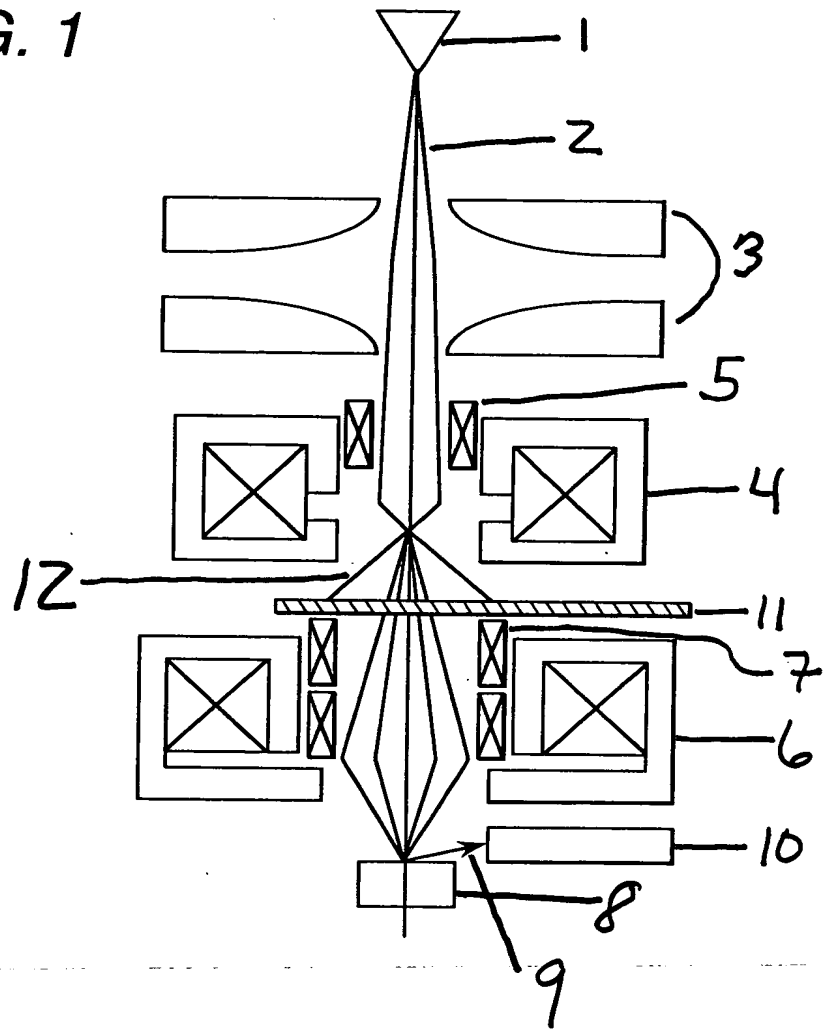


FIG. 2

